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AUTHOR Hazelton, Alexander E.: And Others
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ABSTRACT

Through joint planning with a number of school districts and the Region X Title I Technical Assistance Center, and with the help of a Title I Refinement grant, Alaska has developed a system of data storage and retrieval using microcomputers that assists small school districts in the evaluation and reporting of their Title I programs. Although this system serves as a vehicle for federal and state reporting, its primary function is to help school districts evaluate their own Title I programs. The microcomputer system utilizes database management techniques, which not only reduce storage requirements, but allow for ad hoc reporting by clerical personnel. This ad hoc reporting capability frees small school districts from being dependent upon having access to programming expertise for producing new or one-time reports. The use of technology in Alaska is described, as is the Title I refinement application program and how it interfaces with the database management system. Examples of ad hoc and standard reports are described. (Author/GK)

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A Title I Refinement
ALASKA

BY
Alexander E. Hazelton
Bina Harris
Alaska Department of Education

Dennis Deck
Region X Technical Assistance
Northwest Regional Educational Laboratory

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INTRODUCTION

Alaska, through joint planning with a number of school districts and the Region X TAC and with the help of a Title I Refinement grant, has developed a system of data storage and retrieval that assists small school districts in the evaluation and reporting of their Title I programs. The system which we are about to describe serves as a vehicle for federal and state reporting but its primary function is to help school districts evaluate their own Title I programs.

Evaluation of local programs and practices in small school districts is usually accomplished with great consternation. It is not uncommon to find large school districts dedicating resources for the sole purpose of local evaluation, but small districts cannot affort to do so. Most foundation funding is based on an enrollment or student count, such as the Average Daily Attendance, Average Daily membership or the instructional unit. The leeway between actual classroom expenditures and foundation revenues do not allow small school districts the luxury to dedicate resources for evaluation. It is hoped that this simple evaluative system as designed will assist these smaller school districts.

USE OF TECHNOLOGY

Alaska has fifty-two school districts with a total statewide student enrollment of 90,000 students in public schools. Seventy five percent of our school districts have less than a 900 student enrollment. It is not uncommon to find school districts with the geographic size of Ohio with an enrollment of about 300 students. The median Alaska school district has less than 500 students. With these and other constraints placed on our school districts Alaska has turned to technology in order to resolve some of its reporting, evaluation and communication problems.

In 1976, in order to deal with its communications problems, the Alaska Department of Education embarked on a massive effort to connect school districts offices with each other and the Department via telecommunications. A project jointly funded by the National Institute of Education (NIE) and the State of Alaska entitled "Educational Telecommunications for Alaska (ETA)" has installed

the basic network statewide and placed microcomputers in every school district office in the state. The equipment consisted of a single disk drive, 32K byte GNAT microcomputer, a (Beehive Micro B2) video monitor, a (Teletype Model 43) printer and a (Vadic) telephone modem for the transmission of messages. Because of the power fluxuations experienced in most of the communities, this equipment was connected to a (Topaz) power protector, with installation taking place between 1978 and 1980. With this equipment school districts can communicate with a host minicomputer (PDP 11/70) located in Juneau via satellite telephone links. This telecommunications system works similar to a post office. Messages are sent from the school districts or the Alaska DOE to the host minicomputer, which acts as a mailbox. The organization to whom the messages are sent may dial up the host computer at their leisure to check for messages directed to them. This hardware configuration has proved quite reliable, however the potential of the system has barely been addressed.

THE TITLE I REFINEMENTS

The district GNAT microcomputer made it possible to consider automating reporting systems such as Title I. One of the initial considerations in computerizing a Title I system was to offer school districts state of the art use of the microcomputer. Such features as the use of data base management systems for ease of data manipulation and storage of reports on diskettes for ease of recall were designed into the basic system. A refinement proposal was drafted and submitted to take advantage of the state of the technology for massaging and reporting Title I data. The purpose of the proposal was to:

1. assist school districts in the evaluation of Title I student progress through the use of the microcomputer with the ability to retrieve ad-hoc reports.

2. assist school districts in reporting results to state and federal Title I agencies by automating reporting (format and producing reports.)including the conversion of pre-post percentile scores to NCE scores.

3. assist the Alaska Department of Education in establishing a statewide Title I data base, utilizing data base management concepts.-

It was suggested that the utility of this project would not only reduce

reporting errors and delays, but also reduce the data burden for small school districts. The first phase focused on the development of local school district capacity in six pilot sites to deal with Title I student records and AI reporting requirements. This phase can stand alone and does not require the implementation of Phases II and III. Phases II and III will focus on the dissemination of Phase I products statewide, and the development of the telecommunications capacity of local school districts to send data to a host computer, a statewide network of data aggregation and a statewide data base. The remainder of this paper will discuss only those activities accomplished in Phase I, the building of local districts capacity to evaluate in a timely fashion their student data and respond of reporting requirements.

Three groups of players were assembled to accomplish the task at hand. The Northwest Regional Educational Laboratory, Technical Assistance Center was invited to assist in the technical requirements of design of the reporting requirements while the Alaska Department of Education focused on the software that would assist local school districts in ad-hoc reporting. School districts were solicited as to their desire to participate in the project.

In order to participate a school district had to have a well run Title I program, be willing to participate in a planning session, computer workshop and onsite training. There was also a required investment by the district to up grading the local computer. The internal memory of the GNAT computer needed to be increased to at least 48K bytes and a second disk drive installed in order to handle the data manipulations from Title I. The upgrading of the microcomputer cost each school district about $1400. There were four types of districts considered as pilot sites:

a) Small single site school districts with limited central office staff.
b) Small multi-site school districts with limited central office staff.
c) Remote school districts with long communications lines.
d) Medium school districts to obtain capacity parameters of the system.

Six pilot sites met the criteria and were willing to make the investment of upgrading their microcomputer. Early on in the project a planning session was held with the pilot sites. This planning session focused on reviewing Title I reporting requirements, defining the capacity of the microcomputer and obtaining information from the pilot sites as to their local reporting needs. It was

interesting to note that most of the school districts had only a vague idea of what information would be useful to them for evaluation.

A second meeting was held for the purpose of training Title I program managers in the use of the Title I application programs and ad-hoc reporting procedures. A second training session was held onsite with both program managers and clerical staff present.

This approach gave each operator hands on experience and offered each district an opportunity to utilize the software in a idiosyncratic manner. An example of this is where one school district is currently using the Title I application programs for all student reporting. The onsite training brought home the need to have ultra redundant training packages. Once in the field, items such as additional diskettes, cable and even extra paper for the printer were unattainable. Our training materials for example included a training manual and a diskette library case containing the following diskettes:

-a load program
-a report program
-a data base practice
-a blank data base
-a query
-a master load program for copy only
-a master report program for copy only
-a master blank data base for initializing only
-a master query launguage for copy only
-and several blank diskettes

These redundant measures helped minimize problems for implementation of the system.

DATA BASE MANAGEMENT

In order to maximize the utility of the microcomputer, data base management concepts were investigated and eventually used. Data base management is not a new concept, but until recently sophisticated software has been unavailable for the microcomputer.

The process of using data base software consists of three stages. First, an analysis of the application and design of a corresponding data structure

is required. The second stage consists of actually programming the data entry programs. The third stage is the programming and testing of the standard report programs. These data entry and report programs are written in a high level language such as Fortran or Basic. For the Title I application, we selected Fortran. The selection of this language was based mainly on economic consideration, since any one of the high level languages would have done an equally acceptable job.

The data base management system allows for both standard and ad-hoc reporting. The standard reporting is pre-programmed in a high level language and described in the application section of this paper. The ad-hoc reporting is accomplished on site with standard English-like commands using a Query language. Altogether the data base management system consists of three modules, a data dictionary language or data definition language, a data management system, and a query system. The data definition language is used to define logical data structures. The date management system consists of a large number of subroutines written in a low level language such as assembly which are callable from the pre-programmed application programs.

The advantages to the data base management system are: more data can be stored on the diskettes, simple data manipulation can be performed by users with a minimum of training and ad-hoc reports can be created by the operator. As mentioned earlier, the query language system facilitates the construction of ad-hoc reports. With this system an operator may set up the parameters of the report, such as spacing, titling and margins. The report can be drawn off with only a few English-like commands. For example say the Title I project director would like to know the name of all the students whose last name begins with "H" a command would simply state:

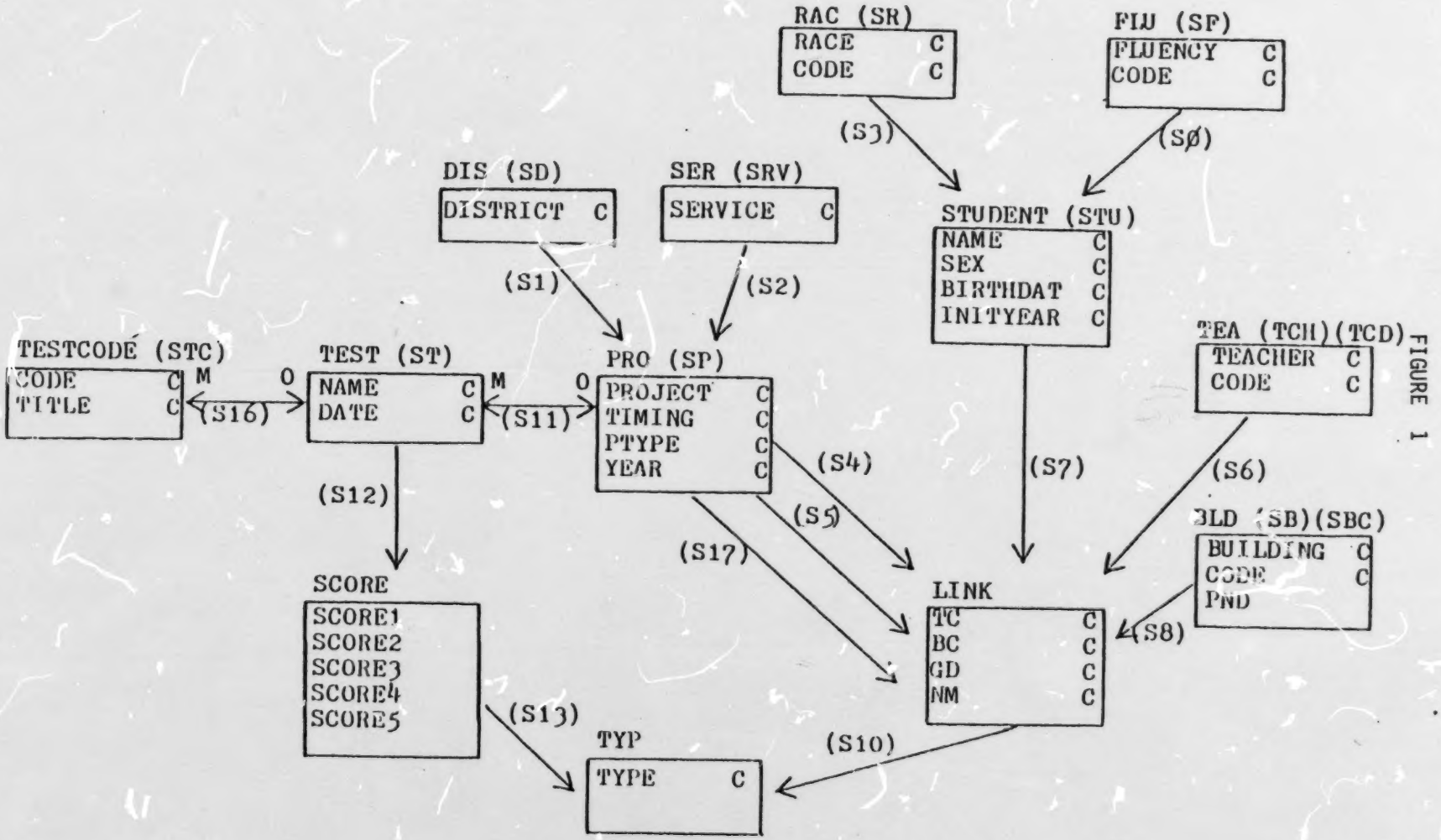
```
LIST STUDENT.NAME FOR STUDENT.NAME="H$" thru STU
```

Directions on how to link various record types are available through a diagram called a schema (Figure 1). This schema and a list of the commands are all an operator needs to draw off data from the data base.

COMPUTER APPLICATION PROGRAMS

The application programs consist of five load programs and four standard

FIGURE 1



Title I Schema

FIGURE 1

report programs. The initial load program is labeled FIRST. This program has two functions; it creates or changes district information and automatically l loads the various tabled information such as race with its associated code, language fluency with its associated code, etc. This program called FIRST would most likely be used only once or twice during the life of the system. The second load program is ADMIN. This program presents a menu and instructs the users in entering information concerning projects, teachers and buildings.

The third load program is entitled TEP an acronym for Test Entry Program. Both the ADMIN and TEP programs are utilized only once a year and require only a few minutes to enter this data. The final two load programs SDEP (Student Data Entry Program) and TSEP (Test Score Entry Program) build the heart of the data base and allow for the entering, changing, and deleting of data throughout the year. For smaller schoo districts, the data base is functional for multiyear Title I student accounting.

Three of the four programs are required for Title I reporting. They are: the GIF (General Information Form) that is printed in two parts, the COMP (Computation of test score information by project and grade) which is also printed in two parts, and the ACH (Achievement level by project and grade report). The fourth report generated by the microcomputer is the TAD (Turnaround Document) which is used to return the information stored on the diskettes to the Title I teachers. All of these reports are automatically produced and remain on the diskettes until they are again requested or written over to establish new updated reports. Examples of the standard forms appear as follows:

Figure 2 GIF (General Information Form)
Figure 3 COMP (Computation of Test score info by project and grade)
Figure 4 ACH (Achievement by level by project and grade)
Figure 5 TAD (Two copies of the Turnaround Document)

The Title I application was bench tested using a single density, single side diskette which accommodates about 2500 student entries. The major problem we have encountered with the system is the amount of time required to load student data. The loading time increases as the data base

grows. With about 200 Title I student entries in the data base it takes about one minute per entry. However, when the data base is increased to about 600 students, the entry time increases to about two minutes per entry. One might ask if the entry time off-sets the utility of the system for medium size Title I programs. The answer we believe depends on how often the data is called up. If a school district has 500 students in its Title I program and only uses the system to compile the required Title I reports, the answer may be that the microcomputer application is more trouble than it's worth. On the other hand, if the school district uses the data in planning and formative evaluation, the load time is well worth the effort.

For Alaska, these application programs have a great deal of utility. Currently, there are forty-five Title I projects in Alaska. The largest project serves some 1300 Title I students, the smallest serves 12 students. All in all the data entry time for the average Title I project in Alaska is about two hours. The increase in time for entry as the data base grows may be a function of the operating system. We are currently using CP/M version 1.4 on a 8080 chip. We plan to experiment using a Z80 chip and possibly version 2.0 of CP/M.

GENERAL INFORMATION FORM

I. ESEA TITLE I PARTICIPATION INFORMATION - REGULAR SCHOOL YEAR

1. Number of public school attendance areas whose students were eligible for Title I services during the Regular school term.

12

2. Number of public school attendance areas whose students received Title I services during the Regular school term.

8

3. Number (unduplicated count) of Title I participants during the Regular school term by grade and type of institution.

Grade	Public	Nonpublic	Total
P	0	0	0
K	0	0	0
1	0	0	0
2	0	0	0
3	7	0	7
4	1	0	1
5	0	0	0
6	0	0	0
7	0	0	0
8	0	0	0
9	0	0	0
10	0	0	0
11	0	0	0
12	0	0	0
TOTAL	8	0	8

4. Total number of Title I participants during the Regular school term in local institutions for neglected or delinquent children within the district boundaries.

7

FIGURE 2
GIF

5. Number (duplicated count) of Title I participants during the Regular school term by service area and type of institution.

Service Area	Public	Nonpublic	Total	Local N/D Institution
INSTRUCTIONAL:				
Engl(limtd backgrnd)	0	0	0	0
Reading	4	0	4	7
Other language arts	0	0	0	0
Mathematics	6	0	6	0
Vocational	0	0	0	0
Special areas	0	0	0	0
SUPPORTING:				
Social work				
Health, Nutrition				
Pupil transportation				
Other services				

6. Total number (unduplicated count) of Title I participants during the Regular school term by racial/ethnic group.

Racial/Ethnic Group	Total
American Indian or Alaskan Native	6
Asian or Pacific Islander	2
Black, not of Hispanic Origin	2
White, not of Hispanic Origin	3
Hispanic	2
TOTAL (unduplicated count)	15

FIGURE 2 (cont)
GIF

TYPE COMP.PRN

VERSION 1.0 2/3/81 TEST

READING 80-81

Date: 03/26/81

Grade	Test	Number of Students	Percentile rank of Class: PRE	Percentile rank of Class: POS	Average NCE Scores: PRE	Average NCE Scores: POS	Average NCE Gain:
2	VOCAB	0					
	COMPR	0					
	TOTAL	0					
3	VOCAB	3	46.	53.	47.9	51.8	3.9
	COMPR	3	41.	53.	45.1	51.8	6.6
	TOTAL	0					
4	VOCAB	3	37.	42.	43.1	45.8	2.8
	COMPR	3	44.	42.	46.8	45.8	-1.0
	TOTAL	3	37.	50.	43.1	50.0	6.9
5	VOCAB	1	30.	35.	39.0	41.9	2.9
	COMPR	0					
	TOTAL	0					
6	VOCAB	3	41.	43.	45.0	46.3	1.3
	COMPR	0					
	TOTAL	0					
7	VOCAB	0					
	COMPR	0					
	TOTAL	0					
8	VOCAB	0					
	COMPR	0					
	TOTAL	0					
9	VOCAB	0					
	COMPR	0					
	TOTAL	0					

FIGURE 3
COMP

10	VOCAB	0					
	COMPR	0					
	TOTAL	0					
11	VOCAB	0					
	COMPR	0					
	TOTAL	0					
12	VOCAB	0					
	COMPR	0					
	TOTAL	0					
Total:							
	VOCAB	10	40.	45.	44.7	47.3	2.7
	COMPR	6	42.	45.	46.0	48.8	2.8
	TOTAL	3	37.	50.	43.1	50.0	6.9

12

FIGURE 3 (cont)
COMP

Today's date: 03/23/81

READING 80-81

Grd	PROJECT DESCRIPTION: Project setting code	Hrs/week instruction	Project length (weeks)	Student to Instructor ratio(S:I)	Out-of-level testing	Member-ship	"N"	NORMAL CURVE EQUIVALENTS (NCEs): PRE	POS	Gain
2						0	0			
3						4	3	47.9	51.8	3.9
4						3	3	43.1	45.8	2.8
5						1	1	39.0	41.9	2.9
6						3	3	45.0	46.3	1.3
7						0	0			
8						0	0			
9						0	0			
10						0	0			
11						0	0			
12						0	0			

FIGURE 4

13

Date: 03/23/81

READING 80-81 Tests: TAT 80 09/23/80

Teacher: SWEENEY,MARY Timing FF Type R Year 80-81 TAT 81 10/03/81

BD	Last Name	First Name	Grade	Race	Sex	Date of Birth	Int	Flu	Test: VOCAB Pre	Test: VOCAB Pos	Test: VOCAB Fol	Test: COMPR Pre	Test: COMPR Pos	Test: COMPR Fol	Test: TOTAL Pre	Test: TOTAL Pos	Test: TOTAL Fol	Test: Pre	Test: Pos	Test: Fol	Test: Pre	Test: Pos	Test: Fol
02	FIR	BERT	3	1	M	03/10/71	79	D	45	46		40	0		45	46							
02	HEMLOCK	MARY	3	7	F	06/12/70	78	E	41	59		33	0		41	59							
02	PINE	PETER	3	6	M	04/05/70	79	F	52	55		50	0		52	55							
02	SPRUCE	ANN	3	2	F	01/12/70	79	F	40	0		43	0		40	0							
05	BABSON	ROGER	4	3	M	01/10/70	78	E	48	50		49	53		48	50							
05	LEE	SALLY	4	2	F	02/13/69	79	E	34	45		40	47		34	45							
05	MARTINEZ	TONY	4	1	M	03/14/70	78	F	30	32		43	50		30	32							

FIGURE 5
TAD (Sample 1)

TAD

VERSION 1.0 2/3/81 TEST

Page 1

Date: 03/23/81

READING 80-81 Tests: TAT 80 09/23/80

Teacher: BROWN,RUTH Timing FF Type R Year 80-81 TAT 81 10/03/81

BD	Last Name	First Name	Grade	Race	Sex	Date of Birth	Int	Fil	Test: VOCAB Pre	Test: VOCAB Pos	Test: VOCAB Fol	Test: COMPR Pre	Test: COMPR Pos	Test: COMPR Fol	Test: TOTAL Pre	Test: TOTAL Pos	Test: TOTAL Fol	Test: Pre	Test: Pos	Test: Fol	Test: Pre	Test: Pos	Test: Fol
05	QUAIL	ROBERT	5	4	M	06/10/69	77	D	30	35		0	0		30	35							
05	CARTER	GINGE	6	7	M	01/10/68	62	A	46	48		0	0		46	48							
05	LODI	PAUL	6	6	M	02/25/68	78	B	39	41		0	0		39	41							
05	RACE	CARLA	6	5	F	06/14/68	78	C	37	40		0	0		37	40							

FIGURE 5
TAD (example 2)